

REMARKS

Claims 1-32 will be pending upon entry of the present amendment. Claims 27 and 28 are herewith amended.

Applicant thanks the Examiner for indicating the allowability of the subject matter of claim 26.

The Examiner has rejected claim 18 under 35 U.S.C. § 112 as being indefinite, stating that claim 28 lacks proper antecedent basis. Accordingly, claim 28 has been amended to depend from claim 27, which provides the proper antecedence for the limitation of claim 28.

The Amendment to claim 27 is made to correct a minor error and does not affect the scope.

The Examiner has rejected claims 1-3, 5-7, 20, 24, 29, and 32 under 35 U.S.C. § 102(b) as being anticipated by Roller et al. (U.S. Patent No. 4,371,777, hereafter "Roller"). The Examiner has rejected claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by Nauwerth (U.S. Patent No. 4,327,282). The Examiner has rejected claim 4, 8-13, 15-19, 21-23, 27, 28, 30, and 31 under 35 U.S.C. § 103(a) as being unpatentable over Roller in view of Gusmer (U.S. Patent No. 3,782,456), claim 14 under 35 U.S.C. § 103(a) as being unpatentable over Roller in view of Gusmer, and further in view of Mexiner (U.S. Patent No. 4,230,935), and claim 25 under 35 U.S.C. § 103(a) as being unpatentable over Roller in view of Bohlender et al. (U.S. Patent No. 4,814,584, hereafter "Bohlender").

For the convenience of the Examiner, the rejections will be addressed in the order established in the recent Office Action, except that the rejection of claims 1 and 2 over Nauwerth will be addressed with the rejection of the same claims over Roller.

Claim 1 recites, in part, "first and second bus plates, and a plurality of positive temperature coefficient elements...sandwiched between the bus plates..., each positive temperature coefficient element including: first and second conductive plates, and a plurality of positive temperature coefficient heating stones...sandwiched between the conductive plates."

Roller fails to teach each of the limitations of claim 1. In particular, Roller fails to teach a plurality of positive temperature coefficient elements sandwiched between bus plates. As defined in claim 1, a positive temperature coefficient element (hereafter "PTC element") includes first and second conductive plates, and a plurality of positive temperature coefficient heating

stones. For example, Figure 4B of the present application illustrates one such element, including first and second conductive plates, 16a, 16b and a plurality of positive temperature coefficient heating stones, 16c sandwiched between the conductive plates. While Figure 4B is merely one example of a PCT heating element, and while claim 1 is not limited to the configuration shown in Figure 4B, claim 1 clearly recites that each PTC element includes first and second conductive plates and a plurality of positive temperature coefficient heating stones sandwiched therebetween.

Referring now to Roller's Figure 1, it may be seen that Roller teaches a heating element 5, including PCT elements 10 between contact leaves 9. It might be argued that the combination of Roller's PCT elements 10 and contact leaves 9 are, as a unit, substantially analogous to *one* of the plurality of positive temperature coefficient elements recited in claim 1. However, Roller fails to disclose any other element recited in claim 1. For example, claim 1 recites a plurality of positive temperature coefficient elements, while Roller teaches only a single heating element 5. In addition, claim 1 recites first and second bus plates, between which the plurality of positive temperature coefficient elements is sandwiched, and with which the elements are in electrical contact. Roller is silent with respect to such bus plates, and further, teaches away from such a configuration by including electrically insulative mica layers 15 over the conductive leaves 9. Accordingly, Roller fails to teach each and every limitation of claim 1, which is thus allowable thereover. Dependent claim 2 is also therefore allowable over Roller.

Nauerth fails to teach each of the limitations of claim 1. In particular, Nauerth fails to teach a plurality of positive temperature coefficient elements, each including first and second conductive plates and a plurality of positive temperature coefficient heating stones. In addition, Nauerth fails to teach first and second bus plates, between which the plurality of positive temperature coefficient elements is sandwiched, in electrical contact therewith. Accordingly, claim 1, together with dependent claim 2, is allowable over Nauerth.

Claim 3 recites, in part, "a heating element...including first and second bus plates and a plurality of positive temperature coefficient elements in electrical contact with, and sandwiched between the bus plates in an electrically parallel configuration, each positive temperature coefficient element including: first and second conductive plates, and a plurality of positive temperature coefficient heating stones...sandwiched between the conductive plates...."

Roller fails to teach at least the recited limitations of claim 3, and accordingly, fails to anticipate all the limitations thereof. Claim 3 is allowable over Roller, together with dependent claims 4-9.

Claim 20 recites, in part, “a heating element...including: first and second bus plates, and a plurality of positive temperature coefficient heating elements in electrical contact with, and sandwiched between the bus plates in an electrically parallel configuration, each positive temperature coefficient element including: first and second conductive plates, and a plurality of positive temperature coefficient heating stones...sandwiched between the conductive plates....” Roller fails to teach all the limitations of claim 20. Accordingly, claim 20, together with dependent claims 21-28, is allowable over Roller.

Claim 29 recites, *inter alia*, “applying a voltage to a heating element *encapsulated* in a cavity between the first and second blocks (emphasis is added).” Roller fails to teach at least the cited portion of claim 29. Applicant calls the Examiner’s attention to page 11 of the present application, beginning at line 4, which states, “In the case of the illustrated embodiment [see Figures 5 and 6] of the invention, the heat exchanger blocks 114 and 120 are configured to mate together to completely enclose the heating elements, power connections, and fluid heating tubes.” Continuing at line 12, the specification states, “It will be recognized that the explosion proof nature of the heat exchanger blocks illustrated in Figures 4 and 5 is independent of the type of heating element employed. Thus, PTC elements in configurations other than those disclosed herein, as well as other types of heating coils and elements used with heat exchanger blocks that *encapsulate* the elements are also within the scope of the invention” (emphasis added). It may be seen from the above quoted text that the term “encapsulated” makes reference to a heating element that is fully enclosed within the heat exchanger block.

In rejecting claim 29, the Examiner has cited Roller as anticipating the limitations thereof. However, Roller shows an assembly (see Figure 1) in which the elements 10 are not encapsulated, but are open on at least two sides. Thus, Roller fails to teach applying voltage to a heating element encapsulated in a cavity between first and second blocks, and accordingly, fails to anticipate each of the limitations of claim 29. Claim 29 is thus allowable, together with dependent claims 30-32, over Roller.

Applicant believes that claim 32 is also allowable on its own merits apart from its allowability as depending from allowable base claim 29.

In rejecting claim 4, the Examiner relies on Roller to teach all the limitations of claim 3, from which claim 4 depends. As has been demonstrated, Roller fails to teach or suggest all the limitations of claim 3. Inasmuch as Gusmer cannot remedy the deficiencies of Roller, with respect to the limitations of claim 3, dependent claims 4, 8, and 9 are also allowable over a combination of Roller with Gusmer.

Additionally, claims 4 and 8 are allowable on their own merits, apart from their dependence on an allowable base claim. Claim 4 recites a cavity formed in the first surface. Applicant understands the term "cavity," as used in claims 4 and 8, as an opening being defined on all sides by a sidewall, as may be seen, in one example, in Figure 5 of the present application. In contrast, Gusmer teaches a series of parallel grooves 3, with each groove open at the ends. Thus, Gusmer fails to teach a cavity as recited in claims 4 and 8. Accordingly, claims 4, 8, and 9 are allowable over the cited art.

Claim 10 recites a first heat exchanger block having a first surface, and a cavity formed in the first surface, a heating element being encapsulated within the cavity. In rejecting claim 10, the Examiner acknowledges that Roller fails to teach a cavity formed in the surface of the heat exchanger, relying on Gusmer for this teaching. However, Gusmer also fails to teach this limitation, teaching instead a series of parallel grooves 3 with open ends (see, for example, Figure 1). Clearly, Gusmer cannot resolve the admitted deficiencies of Roller, with respect to the limitations of claim 10. Furthermore, Neither Roller nor Gusmer provides any suggestion or motivation to provide a cavity for encapsulating an element. From the previously cited text of the present application, it may be seen that one advantage of an encapsulated element is that such a fluid heater can be explosion proof. Neither Roller nor Gusmer suggest the desirability of such a feature, nor does either reference provide any other motivation for encapsulation. Accordingly, the claim 10, together with dependent claims 11-13, is allowable over the cited art.

Claims 11 and 12 are also allowable on their own merits, apart from their dependence on an allowable base claim.

Claim 16 recites, in part, "a first cavity formed in the first heat exchanger block in the first surface; a second cavity formed in the second heat exchanger block in the second surface, the second cavity positioned such that, when the first and second surfaces are in face to face contact, the first and second cavities are opposite one another and form a chamber between

the first and second blocks....” Applicant understands the term “chamber” as referring to a space that is substantially fully enclosed. Roller and Gusmer each fail to teach this limitation, each providing for open ended spaces to receive heating elements therein, as may be seen in Roller’s Figure 1 and Gusmer’s Figure 1. Accordingly, claim 16 is allowable over a combination of Roller with Gusmer. Dependent claims 17-19 are also therefore allowable.

In rejecting claims 21-23, 27, and 28, the Examiner relies on Roller to teach all the limitations of base claim 20. As has been demonstrated previously, Roller fails to teach all the limitations of claim 20. Gusmer cannot resolve the inadequacies of Roller with respect to the limitations of claim 20, and accordingly, claims 21-23, 27, and 28 are allowable over a combination of Gusmer with Roller. Additionally, claims 21 and 27 are allowable on their own merits, inasmuch as neither Roller nor Gusmer teach a cavity configured to encapsulate a heating element, as recited in claim 21, or an aperture in a plate configured to encapsulate a heating element, as recited in claim 27.

With respect to the rejection of claims 30 and 31, the Examiner again relies on Roller to teach all the limitations of base claim 29. As has been demonstrated, Roller fails to teach a heating element encapsulated in a cavity between first and second blocks, as recited in claim 29. Gusmer also fails to teach this limitation, teaching open ended grooves 3 (see Figure 1) for receiving the heating elements. Inasmuch as neither Gusmer nor Roller teach or suggest the cited limitation, claim 29, together with dependent claims 30 and 31 is allowable over a combination of Gusmer and Roller.

In rejecting claim 14, the Examiner relies on a combination of Roller and Gusmer to teach all the limitations thereof with the exception of an aperture in the first heat exchanger block and an explosion proof seal closing the aperture around the cable, citing Mexiner as teaching these limitations. A combination of Mexiner with Roller and Gusmer is inappropriate, as discussed below.

Mexiner is configured to be immersed in a small volume of fluid (such as a beverage) for heating the fluid (see column 1, lines 5-14), and provides a tube shaped extension 24 configured to prevent fluid from entering the interior of its device while immersed (see column 3, lines 18-53). The Examiner argues that it would be more convenient to provide Roller and Gusmer with Mexiner’s tube shaped extension. However, neither Roller nor Gusmer is

configured to be immersed, nor does either reference teach or suggest any motivation to provide a fully enclosed housing, and so neither has a need for Mexiner's extension. On the contrary, Roller and Gusmer each provide a simple electrical connection to their respective elements, which would be made unnecessarily more complex by the addition of an extension as taught by Mexiner, and would derive no additional benefit therefrom. Thus, Roller and Gusmer each teach away from such an addition. Clearly, claim 14 is allowable over the cited references.

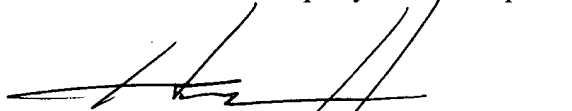
In rejecting claim 25, the Examiner relies on Roller to teach all the limitations of base claim 20. As has been demonstrated previously, Roller fails to teach all the limitations of claim 20. Bohlender cannot resolve the inadequacies of Roller with respect to the limitations of claim 20, and accordingly, claim 25 is allowable over a combination of Bohlender with Roller.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited. In the event the Examiner finds minor informalities that can be resolved by telephone conference, the Examiner is urged to contact applicants' undersigned representative at (206) 694-4848 in order to expeditiously resolve prosecution of this application.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

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